

Claims

What is claimed is:

1. An apparatus to facilitate operation of a small form factor device that is removably attached at a connector, comprising:
 - a selection system operatively coupled to route data between a bus and the connector, the selection system operating in a first mode to convert between a protocol supplied at the connector and a protocol of the bus if the device attached at the connector employs a different protocol from the protocol of the bus, and
 - the selection system operating in a second mode to pass the protocol between the bus and the connector without protocol conversion if the device attached at the connector employs a protocol supported by the bus.
2. The apparatus of claim 1, the connector further comprising a detector operative to detect the device attached at the connector and provide type information to the selection system identifying a type of the device, the selection system selecting one of the operating modes based on the type information.
3. The apparatus of claim 2, the selection system further comprising:
 - a first interface that implements the first mode,
 - a second interface that implements the second mode, and
 - a selector that connects the connector with the bus through a selected one of the first and second interfaces based on the type information.
4. The apparatus of claim 3, the first interface component comprises a controller that, when connected to the bus, is exposed to the bus as a device controller supported by the bus.
5. The apparatus of claim 4, the device controller further comprises a mass storage controller operative to communicate data with a small form factor storage device attached at the connector.

6. The apparatus of claim 3, the second interface further comprises an electrical converter operative to accommodate power requirements of the device attached at the connector based on the type information.
7. The apparatus of claim 3, the selector comprising a multiplexer.
8. The apparatus of claim 3, the device attached at the connector being configured to employ one of the protocol of the bus and a predetermined other protocol supported by the first interface.
9. The apparatus of claim 3, the selector is coupled between the first and second interfaces and the bus.
10. The apparatus of claim 3, the selector is coupled between the connector and the first and second interfaces.
11. The apparatus of claim 10, further comprising a hub coupled between the first and second interfaces and the bus.
12. The apparatus of claim 1, the protocol of the bus comprising a serial bus protocol.
13. The apparatus of claim 12, the serial bus protocol conforming to one of universal serial bus, IEEE 1394.
14. The apparatus of claim 1, the selection system implemented as an integrated circuit.
15. The apparatus of claim 1, the connector is a first connector, and the selection system is coupled between the first connector and a second connector, the second connector being configured to removably connect to a mating connector part that is electrically associated with the bus.

16. A system to facilitate use of an existing bus by one of a plurality of removable devices implementing at least two different bus protocols, each one of the plurality of devices being adapted to expose itself to the bus as a type of device native to the existing bus, the system comprising:

a connector configured to electrically and operatively couple with each of the plurality of removable devices; and

a selector operative to selectively connect the connector with the bus through a selected one of at least two interfaces based on a protocol employed by the removable device attached at the connector.

17. The system of claim 16, the selector is operative to employ the selected interface based on information that indicates the removable device attached at the connector is a predetermined type of device.

18. The system of claim 16, a first of the at least two interfaces further comprises a controller that, when connected to the bus by the selector, is exposed to the bus as a device controller native to the bus operative to convert between a protocol employed by the bus and a predetermined protocol of the removable device attached at the connector.

19. The system of claim 18, the device controller further comprises a mass storage controller operative to communicate data with a small form factor storage device attached at the connector.

20. The system of claim 18, a second of the at least two interfaces being operative to pass data between the connector and bus without protocol conversion.

21. The system of claim 20, the second interface further comprises an electrical converter operative to accommodate power requirements of the one removable device attached at the connector.

22. The system of claim 16, the bus employs a protocol conforming to a standard serial bus protocol.
23. The system of claim 16, the selector is coupled between the interfaces and the bus.
24. The system of claim 16, the selector is coupled between the connector and the interfaces.
25. The system of claim 24, further comprising a hub coupled between the interfaces and the bus.
26. The system of claim 16 implemented as an integrated circuit.
27. The system of claim 16, the connector is a first connector, the selector and the interfaces being coupled between the first connector and a second connector, the second connector being configured to removably connect to a mating connector part that is associated with the bus, whereby the system forms part of a modular connector.
28. A system to facilitate use of a small form factor device that is removably attachable to a connector, comprising:
 - means for converting between a standard bus protocol and a protocol employed by the small form factor device;
 - means for passing substantially unchanged the protocol of the small form factor device;
 - means for selecting a path through one of the means for converting and the means for passing in response to attaching the small form factor device at the connector; and
 - means for connecting the connector with a bus through the selected path.

29. A method for connecting a small form factor device with an internal bus that employs a predetermined protocol, the method comprising:

detecting a type of device attached at a connector;

selecting one of at least two communications paths based on the detected type of device; and

connecting the connector with the bus through the selected communications path, such that data communications with bus can occur according to the predetermined protocol of the bus.

30. The method of claim 29, further comprising providing type information to the selection system identifying the detected type of device in response to the detecting, and selecting one of at least operating modes having different protocol characteristics based on the type information.

31. The method of claim 30, further comprising:

if the type information indicates a first type of device, the connecting further comprising connecting the connector with the bus through a first interface that passes data through the first interface without protocol conversion.

32. The method of claim 31, further comprising controlling electrical power provided to the connector for the device based on the type information.

33. The method of claim 31, further comprising:

if the type information indicates a second type of device, the connecting further comprising connecting the connector with the bus through a second interface that implements protocol conversion for data communicated between the bus and the device.

34. The method of claim 33, the second interface further comprises a mass storage controller operative to communicate data with a small form factor storage device attached at the connector.

35. The method of claim 33, further comprising using a serial bus protocol for data communicated between each of the first and second interfaces and the bus.
36. The method of claim 35, the serial bus protocol conforming to one of universal serial bus protocol and IEEE 1394.
37. The method of claim 33, further comprising routing data communicated to and from a selected one of the first and second interfaces and the bus through a hub.